

CLAIMS

What is claimed is:

1. A method for controlling a RAID subsystem, comprising:
 - transmitting a first command to a RAID controller to read a block of data from an array of storage drives;
 - receiving the block of data from the RAID controller;
 - detecting errors in the block of data received from the RAID controller;
 - if an error is detected, transmitting a second command to the controller to perform a first reconstruct read of the block of data; and
 - receiving the reconstructed block of data.
2. The method of claim 1, wherein:
 - the first command includes an instruction directing the RAID controller to use a first of a plurality of reconstruct read algorithms; and
 - the second command includes an instruction directing the RAID controller to use a second one of the plurality of reconstruct read algorithms.
3. The method of claim 1, further comprising:
 - detecting errors in the reconstructed block of data; and
 - if an error is detected in the reconstructed block of data, transmitting a third command to the RAID controller to perform a second reconstruct read of the block of data using an algorithm different from the algorithm used to perform the first reconstruct read.
4. The method of claim 3, wherein:
 - the second command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and
 - the third command includes an instruction directing the RAID controller to read the block of data from a second of the two copies.

5. The method of claim 1, wherein:
 - the first command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and
 - the second command includes an instruction directing the RAID controller to read the block of data from a second of the two copies of the block of data.
6. The method of claim 5, further comprising comparing the first read block of data with the reconstructed block of data.
7. The method of claim 1, further comprising, following detection of an error, providing an indication of the error whereby a faulty drive may be replaced.
8. A host computer system coupled to a RAID storage subsystem, comprising:
 - means for transmitting a first command to a RAID controller to read a block of data from an array of storage drives;
 - means for receiving the block of data from the RAID controller;
 - means for detecting errors in the block of data received from the RAID controller;
 - means for transmitting a second command to the controller to perform a first reconstruct read of the block of data if an error is detected; and
 - means for receiving the reconstructed block of data.
9. The system of claim 8, wherein:
 - the means for transmitting the first command includes means for generating an instruction directing the RAID controller to use a first of a plurality of reconstruct read algorithms; and
 - the means for transmitting the second command includes means for generating an instruction directing the RAID controller to use a second one of the plurality of reconstruct read algorithms.
10. The system of claim 8, further comprising:

means for detecting errors in the reconstructed block of data; and

means for in the reconstructed block of data, transmitting a third command to the RAID controller to perform a second reconstruct read of the block of data using an algorithm different from the algorithm used to perform the first reconstruct read if an error is detected.

11. The system of claim 10, wherein:

the means for transmitting the second command includes means for generating an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and

the means for transmitting the third command includes means for generating an instruction directing the RAID controller to read the block of data from a second of the two copies.

12. The system of claim 8, wherein:

the means for transmitting the first command includes means for generating an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and

the means for transmitting the second command includes means for generating an instruction directing the RAID controller to read the block of data from a second of the two copies of the block of data.

13. The system of claim 12, further comprising means for comparing the first read block of data with the reconstructed block of data.

14. The system of claim 8, further comprising, means for providing an indication of the error whereby a faulty drive may be replaced following detection of an error.

15. A computer program product of a computer readable medium usable with a programmable computer, the computer program product having computer-readable

code embodied therein for reading data from a RAID subsystem, the computer-readable code comprising instructions for:

- transmitting a first command to a RAID controller to read a block of data from an array of storage drives;
- receiving the block of data from the RAID controller;
- detecting errors in the block of data received from the RAID controller;
- if an error is detected, transmitting a second command to the controller to perform a first reconstruct read of the block of data; and
- receiving the reconstructed block of data.

16. The computer program product of claim 15, wherein:

- the first command includes an instruction directing the RAID controller to use a first of a plurality of reconstruct read algorithms; and
- the second command includes an instruction directing the RAID controller to use a second one of the plurality of reconstruct read algorithms.

17. The computer program product of claim 15, further comprising instructions for:

- detecting errors in the reconstructed block of data; and
- if an error is detected in the reconstructed block of data, transmitting a third command to the RAID controller to perform a second reconstruct read of the block of data using an algorithm different from the algorithm used to perform the first reconstruct read.

18. The computer program product of claim 17, wherein:

- the second command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and
- the third command includes an instruction directing the RAID controller to read the block of data from a second of the two copies.

19. The computer program product of claim 15, wherein:

the first command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and

the second command includes an instruction directing the RAID controller to read the block of data from a second of the two copies of the block of data.

20. The computer program product of claim 19, further comprising instructions for comparing the first read block of data with the reconstructed block of data.

21. The computer program product of claim 15, further comprising instructions for providing an indication of the error whereby a faulty drive may be replaced following detection of an error.

22. A RAID subsystem, comprising:

a plurality of RAID storage drives;

a RAID controller coupled to the RAID storage drives and to a host device;

and

a processor programmed with instructions for:

receiving a first command from the host device to read a block of data from an array of storage drives;

obtaining the block of data from the RAID drives;

transmitting the block of data to the host device;

if the host device detects an error in the transmitted block of data, receiving a second command from the host device to perform a first reconstruct read of the block of data;

obtaining the reconstructed block of data from the RAID drives; and

transmitting the reconstructed block of data to the host device.

23. The RAID subsystem of claim 21, wherein:

the first command includes an instruction directing the RAID controller to use a first of a plurality of reconstruct read algorithms; and

the second command includes an instruction directing the RAID controller to use a second one of the plurality of reconstruct read algorithms.

24. The RAID subsystem of claim 21, the processor further programmed with instructions for receiving a third command from the host device to perform a second reconstruct read of the block of data using an algorithm different from the algorithm used to perform the first reconstruct read if an error is detected in the reconstructed block of data.

25. The RAID subsystem of claim 24, wherein:

the second command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and

the third command includes an instruction directing the RAID controller to read the block of data from a second of the two copies.

26. The RAID subsystem of claim 23, wherein:

the first command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data; and

the second command includes an instruction directing the RAID controller to read the block of data from a second of the two copies of the block of data.

27. The RAID subsystem of claim 26, the processor further programmed with instructions for comparing the first read block of data with the reconstructed block of data.

28. The RAID subsystem of claim 23, the processor further programmed with instructions for providing an indication of the error whereby a faulty drive may be replaced following detection of an error.